

# SYSTEM AND METHOD FOR PRECISE, ACCURATE AND STABLE OPTICAL TIMING INFORMATION DEFINITION

## 5 ABSTRACT OF THE INVENTION

An optoelectronic timing system includes an adaptive frequency generator system in which optical pulses are developed by a semiconductor laser. The pulses are  
10 directed into a number of time-quantifiable optical paths. Time quantification for a pulse is based upon the time required for a pulse to travel a particular length at the speed of light. Pulses are recombined at a nodal point and exhibit a numerical relationship with the periodicity of  
15 the issued pulse train equal to the numerical relationship between the lengths of the number of optical waveguides. A pulse detector and a regenerator are coupled to the semiconductor laser. A regeneration waveguide having a length equal to the longest of the optical paths is coupled  
20 to receive pulses from the laser. A pulse traveling the regeneration waveguide and directed to the pulse detector and regenerator triggers the laser to issue a next pulse, the physical length of the regeneration waveguide defining a fundamental frequency of the system and the number and  
25 lengths of the optical paths defining multiples of the fundamental frequency.